

REMARKS/ARGUMENTS

Claims 1-6 and 8-12 are pending herein. New claims 11 and 12 have been added as supported by Example 2 in the present specification. Applicants respectfully submit that no new matter has been added.

Examiner Rao is thanked for courtesies extended to Applicants' undersigned representative during a telephonic interview on June 9, 2010. The substance of that interview has been incorporated into the following remarks.

During the interview, Applicants' undersigned representative explained that the conventional wisdom associated with the sodium metal flux technique for growing gallium nitride single crystals is that the technique should be carried out at a relatively low temperature (e.g., 750 - 800 °C) and at a relatively low nitrogen pressure (e.g., 50 atms). This fact is evidenced by paragraph [0158] of the Sarayama reference applied in the Office Action, and is also evidenced by the Rule 132 Declaration of Mr. Makoto Iwai, and the documents attached to that Declaration.

The present invention defies conventional wisdom by performing the sodium metal flux technique at a substantially higher pressure of 300 atms to 1200 atms and at a substantially higher temperature of 850 °C to 1200 °C. The higher pressure and temperature used in the presently claimed method provide a gallium nitride single crystal growth rate that is three-fold to six-fold greater than the 8 µm/hr growth rate reported in Sasaki (please compare the Examples on pages 7-9 of the present specification to Example 7 of Sasaki).

Examiner Rao understood and agreed with all of these arguments during the interview, but indicated that the arguments would be given more weight if submitted

in Declaration form. As explained above, filed herewith is the Declaration of Mr. Makoto Iwai, which should satisfy the request of Examiner Rao.

The prior art rejections asserted in the Office Action are noted, but deemed overcome by the agreement reached during the interview and the Declaration filed herewith. Specifically, while Sasaki discloses a single crystal growth method at a pressure of 100 Pa to 200 MPa (0.00099 atms - 1974 atms), and at a temperature of 300°C to 1200°C, the actual, enabling disclosure of Sasaki carries out the growth process in all instances at pressures of 50 atms or less. As such, Sasaki adopts the conventional wisdom associated with the sodium metal flux technique. There is certainly no disclosure in Sasaki that, if the technique were performed within Applicants' claimed pressure and temperature ranges, a three-fold to six-fold increase in single crystal growth rate could be achieved.

Although not discussed during the interview, Applicants have also made editorial changes to claim 1 to clarify that the atmosphere can contain nitrogen gas alone (please see Example 4 in the specification, for example). Accordingly, claim 1 has been amended to recite that the atmosphere comprises nitrogen gas and has a total pressure of 300 atms to 1200 atms, with a nitrogen pressure of 120 atms to 600 atms. If the atmosphere contains nitrogen only, then the pressure of nitrogen would be 300 atms. On the other hand, if the atmosphere contains nitrogen and another gas, the amount of nitrogen could go as low as 120 atms, in which case the other gas would make up at least 180 atms (to meet the 300 atms minimum total pressure recited in claim 1).

Applicants respectfully submit that all pending claims herein are in condition for allowance. Should Examiner Rao deem that any further action by the Applicants would be desirable in placing this application in even better condition for issue, he is requested to telephone Applicants' undersigned representative.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,



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